



RE
UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,626	10/30/2003	Gerald R. Stanley	11336/585(P04016US)	7324
27879	7590	08/12/2004	EXAMINER	
INDIANAPOLIS OFFICE 27879 BRINKS HOFER GILSON & LIONE ONE INDIANA SQUARE, SUITE 1600 INDIANAPOLIS, IN 46204-2033			FAULK, DEVONA E	
		ART UNIT	PAPER NUMBER	
		2644		

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/697,626	STANLEY, GERALD R.
	Examiner	Art Unit
	Devona E. Faulk	2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 13 October 2003.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-32 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-32 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1.) Certified copies of the priority documents have been received.
 2.) Certified copies of the priority documents have been received in Application No. _____.
 3.) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1,15 and 26** are rejected under 35 U.S.C. 102(b) as being anticipated by Kim (U.S. Patent 5,598,480).

Regarding **claim 1**, Kim discloses a driver circuit having an input with an input impedance, wherein the driver circuit comprises a first passive filter (36) coupled to a first speaker driver (30) and a second passive filter (38) coupled to a second speaker driver (32) (See Figure 1; a power amplifier (10) having an input and an output with an output impedance that is between about 25 percent and about 400 percent of the input impedance of the driver circuit (Figure 1); wherein the input of the power amplifier receives the incoming electrical signal, and the output of the power amplifier is coupled to the input of the driver circuit (Figure 1).

Regarding **claim 15**, Kim discloses selecting a first speaker driver having a first cold impedance; selecting a second speaker driver having a second cold impedance (Figure 1) ; constructing a first passive filter having a second cold impedance; constructing a second passive filter having an input and an output; coupling the output of the first passive filter to the first speaker driver so that the input of the first passive filter has a first combined cold impedance (Figure 1) ; coupling the output of the second passive filter to the second speaker driver so that the input of the second passive filter has a second combined cold impedance (Figure 1) ; forming

a passive arrangement of the first speaker driver, the second speaker driver, the first passive filter and the second passive filter by coupling the input of the first passive filter to the input of the second passive filter, where the passive arrangement has an arrangement cold impedance(Figure 1) ; constructing a power amplifier an input for receiving said incoming electrical signal and an output, where the output has an output impedance that is between about 25 percent and about 400 percent of the arrangement cold impedance (Figure 1) ; and coupling the output of the power amplifier to the input of the first passive filter and to the input of the second passive filter (Figure 1). The method is inherent in the functionality of the system.

Regarding **claim 26**, Kim discloses an amplification means for receiving said incoming electrical signal at an input and providing an amplified signal that is a function of the incoming electrical signal at an output that has an output impedance (10, Figure 1); a first filter means for receiving the amplified signal at an input and providing a first filtered signal that is a function of the amplified signal at an output (36, Figure 1); a second filter means for receiving the amplified signal at an input and providing a second filtered signal that is a function of the amplified signal at an output (38, Figure 1); a first speaker driver coupled to the output of the first filter means, where the first speaker driver has a first cold impedance and is driven by the first filtered signal (30, Figure 1); a second speaker driver coupled to the output of the second filter means, where the second speaker driver is driven by the second filtered signal (32, Figure 1); wherein the output impedance of the amplification means is between about 25 percent and about 400 percent of the first cold impedance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 2,3 ,16 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent 5,598,480) in view of Ohyaba et al. (U.S. Patent 4,504,704).

Claims 2 and 3 claim the loudspeaker system of claim 1 wherein the first passive filter comprises an inductor and a capacitor and the second passive filter comprises an inductor and a capacitor. As stated above apropos of claim 1, Kim meets all elements of that claim. Therefore, Kim meets all elements of claims 2 and 3 with the exception of the claimed matter. Ohyaba discloses a passive filter comprised of an inductor and capacitor (Figure 11; column 5, lines 59-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Ohyaba's concept of a passive filter comprised of an inductor and capacitor as claimed in order to provide a loudspeaker unit in which a reproducible frequency band can be extended toward a bass zone.

Claims 16 and 17 claim the method of claim 15 wherein constructing the first passive filter comprises coupling an inductor to a capacitor and wherein constructing the second passive filter comprises coupling an inductor to a capacitor respectively. As stated above apropos of claim 15, Kim meets all elements of that claim. Therefore, Kim meets all elements of claims 16 and 17 with the exception of the claimed matter. Ohyaba discloses a passive filter comprised of an inductor and capacitor (Figure 11; column 5, lines 59-63). The method is obvious. Therefore,

it would have been obvious to one of ordinary skill in the art at the time of the invention to use Ohyaba's concept of a passive filter comprised of an inductor and capacitor as claimed in order to provide a loudspeaker unit in which a reproducible frequency band can be extended toward a bass zone.

5. **Claims 4,5 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent 5,598,480) in view of Widrow et al. (U.S. Patent 4,751,738)

Claim 4 claims the loudspeaker system of claim 1, wherein the passive filter comprises a Butterworth filter. As stated above apropos of claim 1, Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 4 with the exception of the claimed matter. Widrow discloses a passive filter comprised of a fourth-order Butterworth filter. Therefore, it would have been obvious to one of ordinary skill in the art to use Widrow's concept of a passive filter comprised of a fourth-order Butterworth filter for the benefit minimizing frequency roll-offs.

Claim 5 claims the loudspeaker system of claim 4 wherein the first passive filter comprises a fourth-order filter. As stated above apropos of claim 4, the combination of Kim and Widrow meets all elements of that claim. Therefore, the combination meets all elements of claim 4 with the exception of the claimed matter. All elements of claim 5 are comprehended by claim 4.

Claim 18 claims the method of claim 15, wherein the passive filter comprises constructing a Butterworth filter. As stated above apropos of claim 15, Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 18 with the exception of the claimed matter. Widrow discloses a passive filter comprised of a fourth-order Butterworth filter (see abstract). Therefore, it would have been obvious to one of ordinary skill in the art to use

Widrow's concept of a passive filter comprised of a fourth-order Butterworth filter for the benefit minimizing frequency roll-offs.

6. **Claims 8, 19, 27,28 and 32** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent 5,598,480) in view of Alexander (U.S. Patent 5,097,223).

Claim 8 claims the loudspeaker system of claim 1, wherein the power amplifier comprises a current-feedback amplifier. As stated above apropos of claim 1, Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 8 with the exception of the claimed matter. Alexander discloses a power amplifier comprises of a current-feedback amplifier (Figures 2; column 2, lines 4--55). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Alexander's concept of a power amplifier comprised of a current-feedback amplifier in order to achieve a high large-signal bandwidth.

Claim 19 claims the method of claim 15, wherein constructing the power amplifier comprises constructing a current-feedback amplifier. As stated above apropos of claim 15, Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 19 with the exception of the claimed matter. Alexander discloses a power amplifier comprises of a current-feedback amplifier (Figures 2; column 2, lines 4-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Alexander's concept of a power amplifier comprised of a current-feedback amplifier in order to achieve a high large-signal bandwidth.

Claim 27 claims the loudspeaker system of claim 26, wherein the amplification means comprises a current-feedback amplifier. As stated above apropos of claim 26, Kim meets all

elements of that claim. Therefore, Kim meets all elements of claim 27 with the exception of the claimed matter. Alexander discloses a power amplifier comprises of a current-feedback amplifier (Figures 2; column 2, lines 4-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Alexander's concept of a power amplifier comprised of a current-feedback amplifier in order to achieve a high large-signal bandwidth.

Claim 28 claims the loudspeaker system of claim 27, wherein the current-feedback amplifier has an output impedance between about 2 ohms and about 16 ohms. As stated above apropos of claim 27, the combination of Kim and Alexander meet all elements of that claim. Therefore, the combination meets all elements of claim 28 with the exception of the claimed matter. Impedance matching, with regards to speakers is well known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the power amplifier output impedance to match that of the amplifier in order to prevent any effects to the frequency response of the output signal.

Regarding **claim 32**, Kim discloses operating a driver circuit in a temperature range so that an input impedance of the driver circuit is in an operational range; a power amplifier; amplifying the incoming electrical signal; driving the driver circuit with the driving electrical signal. Although he teaches on the above named elements, he fails to teach of using a current-feedback amplifier as claimed. However, the concept of using a current-feedback amplifier as claimed was well known in the art at taught by Alexander. Alexander discloses a power amplifier comprised of a current-feedback amplifier (Figures 2; column 2, lines 4-55). Modifying Kim's apparatus by using Alexander's current-feedback amplifier as the power

amplifier reads on the claimed matter. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Alexander's concept of a power amplifier comprised of a current-feedback amplifier in order to achieve a high large-signal bandwidth.

7. **Claims 6 and 29** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent 5,598,480).

Claim 6 claims the loudspeaker system of claim 1, wherein the first passive filter has an output characteristic termination impedance, the first speaker driver has a cold impedance, and the output characteristic termination impedance of the first passive filter is between about 25 percent and about 400 percent of the cold impedance of the first speaker driver. As stated above apropos of claim 1 Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 6 with the exception of the claimed matter. Although Kim does not specifically teach of the claim language, it is obvious that the filter has some impedance, the driver has an impedance. Impedance matching is well known in the art. It is obvious that the first filter means is between about 25 percent and about 400 percent. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the filter match the cold impedance of the speaker in order to have a more efficient loudspeaker.

Claim 29 claims the loudspeaker system of claim 26, wherein the first filter means has an output characteristic termination impedance, the first speaker driver has a cold impedance and the output characteristic termination impedance of the first filter means is between about 25 percent and about 400 percent of the cold impedance of the first speaker driver. As stated above apropos of claim 26, Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 29 with the exception of the claimed matter. Although Kim does not specifically teach of

the claim language, it is obvious that the filter has some impedance, the driver has an impedance. Impedance matching is well known in the art. It is obvious that the first filter means is between about 25 percent and about 400 percent. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the filter match the cold impedance of the speaker in order to have a more efficient loudspeaker.

8. **Claims 6 and 29** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent 5,598,480) in view of Suguira (U.S. Patent Application 2002/0097097).

Claim 9 claims the loudspeaker system of claim 1, wherein the power amplifier comprises a voltage source amplifier having a ballast resistor with a resistance between about 25 percent and about 400 percent of the input impedance of the driver circuit. As stated above apropos of claim 26, Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 29 with the exception of the claimed matter. Suguira discloses a power amplifier comprising a voltage source amplifier having a ballast resistor (paragraph 0011). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Suguira's concept of a power amplifier in order to prevent deterioration of the power amplifier.

9. **Claims 10-13 and 21-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent 5,598,480) in view of Alexander (U.S. Patent 6,381,334).

Claim 10 claims the loudspeaker system of claim 1, wherein the first speaker driver has a cold impedance of about 4 ohms, the first passive filter has an output characteristic termination impedance of about 4 ohms, and the output impedance of the power amplifier is between 1 ohms and about 16 ohms. As stated above apropos of claim 1, Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 10 with the exception of the claimed matter.

Alexander teaches of a driver exhibiting an impedance of approximately 4 to 10 ohms (column 7, lines 32-37). It would have been obvious to one of ordinary skill in the art at the time of the invention to have the filter termination impedance and the output impedance of the power amplifier match that of the driver in order to prevent the output impedance from negatively effecting the frequency response.

Claim 11 claims the loudspeaker system of claim 10, wherein the second speaker driver has a cold impedance of about 4 ohms, the second passive filter has an output characteristic termination impedance of about 4 ohms , and the output impedance of the power amplifier is between about 2 ohms and about 8 ohms. As stated above apropos of claim 10 the combination of Kim and Alexander meet all elements of that claim. Therefore, the combination meets all elements of claim 11 with the exception of the claim matter. All elements of claim 11 are comprehended by claim 10. Therefore, claim 11 is rejected for reasons given above apropos of claim 10.

Claim 12 claims the loudspeaker system of claim 1, wherein the first speaker driver has a cold impedance of about 8 ohms, the first passive filter has an output characteristic termination impedance of about 8 ohms, and the output impedance of the power amplifier is between 2 ohms and 32 ohms. As stated above apropos of claim 1, Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 12 with the exception of the claimed matter. Alexander teaches of a driver exhibiting an impedance of approximately 4 to 10 ohms (column 7, lines 32-37). A typical impedance for a speaker driver is 8 ohms. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the filter termination

impedance and the output impedance of the power amplifier match that of the driver in order to prevent the output impedance from negatively effecting the frequency response.

Claim 13 claims the loudspeaker system of claim 12, wherein the second speaker driver has a cold impedance of about 8 ohms, the second passive filter has an output characteristic termination impedance of about 8 ohms, and the output impedance of the power amplifier is between about 4 ohms and about 16 ohms. As stated above apropos of claim 12 the combination of Kim and Alexander meet all elements of that claim. Therefore, the combination meets all elements of claim 13 with the exception of the claim matter. All elements of claim 13 are comprehended by claim 12. Therefore, claim 13 is rejected for reasons given above apropos of claim 12.

Claim 21 claims the method of claim 15, wherein selecting the first speaker driver comprises selecting a first speaker driver having a cold impedance of about 4 Ohms. As stated above apropos of claim 15, Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 21 with the exception of the claimed matter. Alexander teaches of a driver exhibiting an impedance of approximately 4 to 10 ohms (column 7, lines 32-37). It would have been obvious to one of ordinary skill in the art at the time of the invention to have a speaker driver with a cold impedance as claimed in order to provide a typical speaker system.

Claim 22 claims the method of claim 21, wherein constructing a power amplifier comprises constructing a power amplifier where the output has an output impedance that is between about 2 ohms and about 8 ohms. As stated above apropos of claim 21, the combination of Kim and Alexander meets all elements of that claim. Therefore, the combination meets all elements of claim 22 with the exception of the claimed matter. It would have been obvious to

one of ordinary skill in the art at the time of the invention to have the power amplifier output impedance match that of the driver in order to prevent the output impedance from negatively effecting the frequency response.

Claim 23 claims the method of claim 15, wherein selecting the first speaker driver comprises selecting a first speaker driver having a cold impedance of about 8 ohms. Alexander teaches of a driver exhibiting an impedance of approximately 4 to 10 ohms (column 7, lines 32-37). A typical impedance for a speaker driver is 8 ohms. It would have been obvious to one of ordinary skill in the art at the time of the invention to have a speaker driver with a cold impedance as claimed in order to provide a typical speaker system.

Claim 24 claims the method of claim 23, wherein constructing a power amplifier comprises constructing a power amplifier where the output has an output impedance that is between about 2 ohms and about 16 ohms. As stated above apropos of claim 23, the combination of Kim and Alexander meets all elements of that claim. Therefore, the combination meets all elements of claim 24 with the exception of the claimed matter. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the power amplifier output impedance match that of the driver in order to prevent the output impedance from negatively effecting the frequency response.

10. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent 5,598,480) in view of Grudin et al. (U.S. Patent Application 2004/0101153).

Claim 14 claims the loudspeaker system of claim 1, further comprising an enclosure, wherein the driver circuit and the power amplifier are each affixed to the enclosure. As stated above apropos of claim 1, Kim meets all elements of that claim. Therefore, Kim meets all

elements of claim 14 with the exception of the claimed matter. Grudin discloses a speaker enclosure (6; Figure 9) that houses a driver (5) and an power amplifier (7) (page 5, paragraph 0068; page 7, paragraph 0091). Thus it would have been obvious to one of ordinary skill in the art to use Grudin's concept of a speaker enclosure housing a driver and power amplifier in order to have an integrated speaker system.

11. **Claim 30** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent 5,598,480) in view of Suguira (U.S. Patent 6,661,290).

Claim 30 claims the loudspeaker system of claim 26, wherein the amplification means comprises a voltage source amplifier with a ballast resistor having a resistance between about 2 ohms and about 16 ohms. As stated above apropos of claim 26, Kim meets all elements of that claim. Therefore, Kim meets all elements of claim 30 with the exception of the claimed matter. Suguira teaches of voltage source amplifier with a ballast resistor (Figure 13; column 2, lines 29-43). Although he fails to specify the resistance of the resistor, it would have been obvious to have the resistor have a resistance have a resistance as claimed in order to have an efficient loudspeaker system.

12. **Claim 31** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent 5,598,480) in view of Alexander (U.S. Patent 5,097,223) in view of Grudin et al. (U.S. Patent Application 2004/0101153).

Regarding **claim 31**, Kim discloses a speaker system including a driver circuit having a cold input impedance; a power amplifier (10); Alexander discloses a power amplifier comprised of a current-feedback amplifier (Figures 2; column 2, lines 4-55). Modifying Kim's speaker system by using Alexander's concept of a current amplifier reads on "a current feedback

amplifier having an output impedance that is substantially matched to the cold input impedance of the driver circuit" and "wherein the current feedback amplifier receives the incoming electrical signal and drives the driver circuit". Although Alexander teaches of a power amplifier comprised of a current-feedback amplifier, he fails to disclose a speaker enclosure housing the driver circuit and the current feedback amplifier. However the concept of a speaker enclosure housing a driver and an amplifier was well known in the art as taught by Grudin. Grudin discloses a speaker enclosure (6, Figure 9) that houses a driver (5) and a power amplifier (7) (page 5, paragraph 0068; page 7, paragraph 0091). Thus it would have been obvious to one of ordinary skill in the art to use Grudin's concept of a speaker enclosure housing a driver and power amplifier in order to have an integrated speaker system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 703-305-4359. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DF



FORESTER W. ISEN
SUPERVISORY PATENT EXAMINER